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審査請求 未請求

（全 2 頁）

㊹反転可能底部つきプラスチツク容器

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㊼実用新案登録請求の範囲

口部つき胴部と、該胴部の下端部分に取付けられた反転可能底部とから成るプラスチツク容器であつて、

該底部は、該胴部下端内側に嵌挿可能な立周壁と、該立周壁の上端から該胴部直径方向内方に向つてのびる環状壁と、該環状壁に連続し当該容器内方に凸であるドーム壁とで構成され、

該立周壁と該環状壁、該環状壁と該ドーム壁の各連結部が薄肉であり、

該立周壁はその下端部が該胴部下端部に接合されている

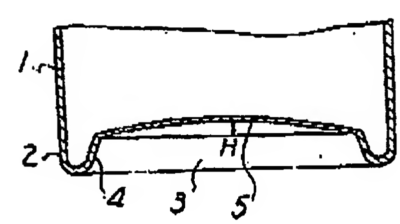
ことを特徴とする反転可能底部つきプラスチツク容器。

図面の簡単な説明

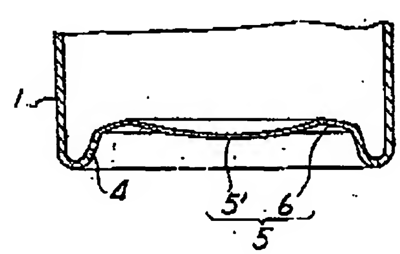
第1図は胴・底一体プラスチツク容器における反転可能底部の形状例を示す断面図、第2図は内容液の充填加圧により生じた底部の反転状態を示す断面図、第3図は本考案の一例における正面断面図（一部破断）、第4図は加圧空気の吹込みにより生じた底部の反転状態を示す断面図、第5図は加圧空気吹込中止時の底部の状態を示す断面図。

11……胴部、13……底部、14……立周壁、15……環状壁、16……ドーム壁、A，B……連結部。

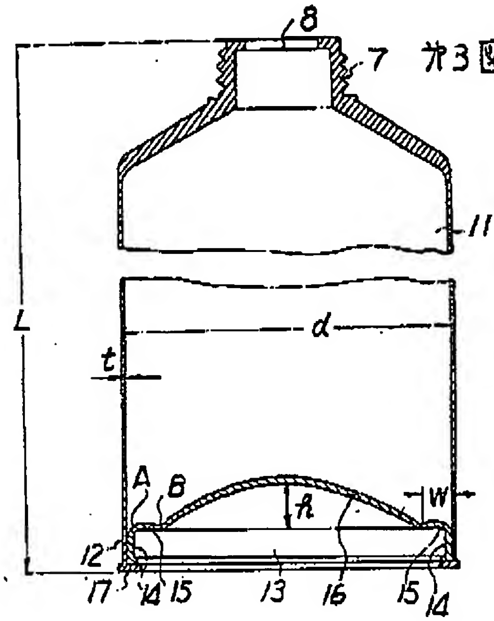
才1図



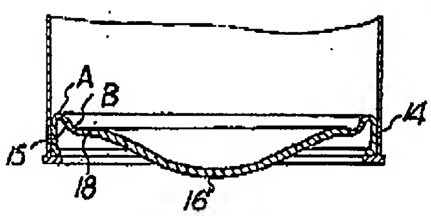
才2図



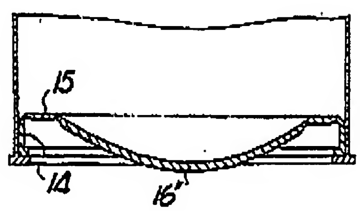
第3図



第4図



第5図



Japanese ~~Patent~~ UM Application Laid-open Sho 57-37827

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Title of the Invention: Plastic Container with Invertible Bottom

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DESCRIPTION

During long-term storage of skin lotions and the like filled and sealed in a plastic container, the content liquid itself or the gas evaporated therefrom may, depending on the liquid properties, permeates into the container wall. Or, the air or oxygen in the headspace of the container may be absorbed in the content liquid. In such cases, the total volume of the liquid and the gas in the container (hereunder "total content volume") decreases. As the barrel section of plastic containers is inherently susceptible to deformation, the barrel portion becomes deformed if the total content volume in the upper region of the container decreases. For example, if the container body is cylindrical, its mid portion in the axial direction becomes somewhat dented compared with the rest of the container body. This is undesirable.

To prevent deformation in the barrel section of a container, it has been known to form the bottom section of the container into a shape that can be more easily deformed than the barrel section, or to make the wall thickness of the bottom section to be thicker than the barrel section. With containers comprising the barrel section and

the bottom section that are made as discrete parts, the bottom section is made non-deformable. Therefore, as an example of a container with deformable and invertible bottom section, a plastic container having the barrel section and the bottom section formed integral is shown (Fig. 1). In the drawing, there is shown the barrel section 1 of a plastic container having the mouth at one of its end At the other end 2, there is provided the bottom section 3 that is continuous from and integral with the barrel section. The bottom section 3 comprises the peripheral wall 4 and the domed thin wall 5 that continues from one end of the peripheral wall 4.

As the container is filled with a content liquid and applied with pressure, the domed thin wall 5 becomes inverted at its mid area 5' (Fig. 2). As the pressure inside the container lowers, the once-inverted domed wall 5 reverts almost to its original form as shown in Fig. 1. When compared with the initial inversion (Fig. 2), the total content volume now decreases, such that the pressure change inside the container is mitigated, and the container is less susceptible to dent in the barrel section.

In this case, however, the bottom 3 must be made capable of reverting to its original domed form by itself after initial inversion, and for which reason the peripheral wall 4 and the invertible domed wall must be joined with a curved surface 6 as shown in Fig. 2. The restorative elasticity of the curved surface 6 must be sufficiently strong for the inverted area to be reverted to the original domed form. Thus, the depth H of the domed wall must not be very deep; rather, it needs to be very shallow. This makes the difference in the inner volume of the area in question before and after inversion very small. For example, with a container measuring about 30 mm in diameter and about 80 mm in height, the depth H is about 3 mm When the

diameter of the barrel section is about 1/2 the height of the container, it is difficult for the difference in the inner volumes before and after inversion to exceed 1%.

In case the content is liquid such as skin lotion, the total content volume inside the container after filling may sometimes decrease by more than 2%, and it becomes impossible to avoid deformation in the mid-body barrel section even if the bottom section of the above description is employed.

The present invention aims at providing a plastic container capable of avoiding deformation in the mid-body barrel section even if it is filled with liquid that causes reduction in the total content volume by about 4 %. According to the present invention, there is provided a plastic container with an invertible bottom section, the container comprising a barrel section having a mouth, and an invertible bottom section attached to the lower end of the barrel section, the bottom section including an upright peripheral wall that can be inserted into the lower end of the barrel section, an annular wall that extends from the upper end of the upright peripheral wall toward the inside in the direction of diameter of the barrel section, and a domed wall that continues from the annular wall and bulges toward the inside of the barrel section, which is characterized in that the junction where the upright peripheral wall merges with the annular wall and the junction where the annular wall merges with the domed wall are thin-walled, and the lower end of the upright peripheral wall is connected to the lower end of the barrel section.

An embodiment of the present invention will be described referring to the drawings.

Fig. 3 is a sectional end view (partly exploded) of an embodiment; Fig. 4 is a sectional view to show when the bottom

section of the container shown in Fig. 3 is inverted by pressurized air blown into the container; and, Fig. 5 is a sectional view to show the bottom section when the blowing of pressurized air is suspended.

In the drawings, there are shown the barrel section 11 of a plastic container having a mouth 7 at one end, and a plastic bottom section 13 formed separately from the barrel section and inserted inside the lower end region 12 of the barrel section. The bottom section 13 includes an upright peripheral wall 14 that can be inserted into the barrel section, an annular wall 15 that extends from the upper end of the upright peripheral wall toward the inside in the direction of diameter of the upright peripheral wall, and a domed wall 16 that continues inwardly from the annular wall 15, surrounded by the annular wall and bulges toward the inside of the container. The junction A between the upright peripheral wall 14 and the annular wall 15, and the junction B between the annular wall 15 and the domed wall 16 are formed thin. The lower end of the upright peripheral wall 14 is connected with the lower end 17 of the barrel section 11 by heat adhesion or any other arbitrary means.

The barrel section of the container according to the embodiment measures 3 cm in diameter (d), about 8 cm in height (L), about 50 cc in inner volume, and 0.3 mm in thickness (t). The bottom section except for the junctions A and B is 1 mm in wall thickness. The junctions A and B are 0.5 mm thick at respective mid sections, with the regions on their both sides gradually increasing in thickness. The annular wall is 3 mm in width (W), and the dome is 6 mm in depth (h).

Prior to filling the container with liquid, pressurized air (1 kg/cm2) is blown into the container from the inlet port 8 at the container mouth. Whereupon, the bottom section 13 becomes

bent at the thin-wall area, causing the annular wall 15 to slant downwardly, which in turn causes the domed wall 16 to be pulled toward the peripheral edge. As a result, the domed wall becomes shallower for that amount, as compared with the domed wall shown in Fig. 1, and the inversion resistance decreases to cause inversion (Fig. 2). The deformation at the junctions A and B greatly contributes to this inversion. The peripheral region 18 of the inverted domed wall 16' becomes slightly flat.

As the blowing of pressurized air is suspended, the bottom section 16' becomes as shown in Fig. 3 due to elasticity of the plastic material. This is the container shown in Fig. 1 in which the domed wall 16 alone is inverted. In other words, the annular wall 15 restores its flat shape, while the domed wall 16 becomes the inverted domed wall 16" without the peripheral area 18 mentioned above.

As the shape of the bottom section 13 of the container becomes as shown in Fig. 3, liquid (45 cc) is filled into the container and the container is sealed. Then, the bottom section 13 is applied with pressing force that acts inwardly in the axial direction of the container, to revert the inverted domed wall 16" to the upward domed wall 16 shown in Fig. 1.

The difference in the inner volume (52 cc) when the container is as shown in Fig. 3 and the inner volume (50 cc) when the domed wall is reverted to the state as shown in Fig. 1 after sealing the container was about 2.0 cc, which corresponds to 4 % of the total content volume of 50 cc.

The container was kept in long-term storage. It was confirmed that no defomation occurred in barrel section.

As the container according to the present invention comprises the bottom peripheral wall, annular wall and domed wall, with the

junctions A and B between respective three walls being made thin, the annular wall first becomes downwardly slanted starting from the junction A when the bottom section is subjected to pressure. This causes deformation at the junction B, and extension of the domed wall 16 to become flat, making it easier for the domed wall to be inverted. Therefore, the depth of the container can be increased as compared with the container shown in Fig. 1 in which it is difficult for the domed wall to be inverted because the domed wall is directly connected to the upright peripheral wall, and thus it becomes necessary to make the domed wall shallow. (In the embodiment described above, whereas H is 3 mm, h is 6 mm. This in fact made it possible to increase the depth by 100 %.) Because the bottom section can be easily inverted despite the domed wall that is deeper, the difference in the inner volume before and after inversion, and thus the inner volume of the container, is greater than containers with prior art bottom. This makes it possible to obtain containers capable of withstanding practical use even when filled with liquids that result in greater difference in the total content volume.